

RHEOTEC* XL and XL+

High performance water-based core coating

VESUVIUS





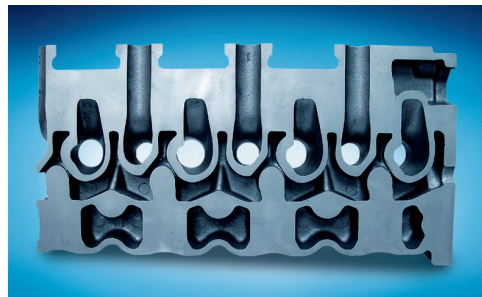
High performance water-based core coatings

for the highest quality demands of the modern foundry

The RHEOTEC XL and XL+ range of water-based coatings have been designed specifically by Foseco to address the needs of the foundry producing grey and ductile iron components to the highest specifications. The increasing complexity and more exacting quality standards (figure 1), combined with the drive to reduce overall costs in the manufacture of critical iron castings, requires optimised coating technology to reduce surface defects (figure 2).

- + Sand expansion (veining)
- + Scabbing
- + Burn-on
- + Metal penetration
- + Retained particulate

Figure 1
Complex internal passages of a cylinder head



RHEOTEC XL and XL+ coatings have been engineered to combine superior rheological characteristics with specific refractory technology, to provide a cost effective solution (figure 3).

- + Excellent dipping characteristics
- + Uniform layer deposition
- + Controlled penetration of the refractory components into the core
- + High insulation
- + High temperature stability

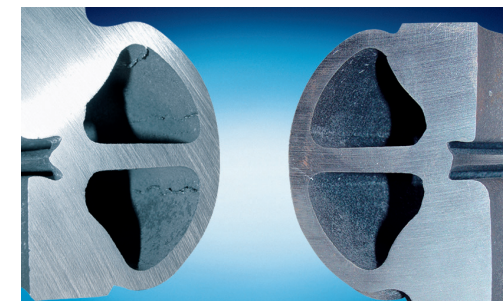


Figure 2
Veining defects in turbo housing (left) eliminated by the use of RHEOTEC XL coatings (right)

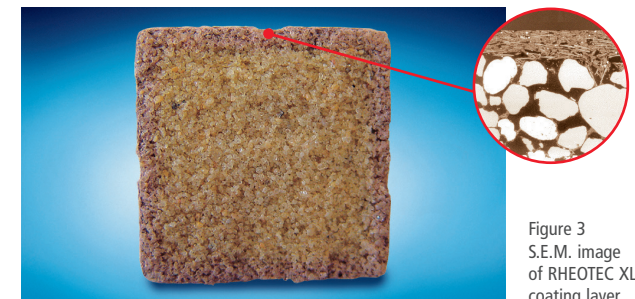


Figure 3
S.E.M. image of RHEOTEC XL coating layer

Superior protection against sand expansion defects

Castings produced using cores made from silica sand have a higher tendency to exhibit sand expansion defects related to the α - β phase transition of quartz at 573 °C, commonly referred to as veining defects. The unique combination of refractory fillers within RHEOTEC XL coatings form a highly insulating layer between the molten metal and the core substrate, which delays and reduces the effect of this phase transition, significantly reducing or eliminating sand expansion related defects (figure 4).

Cost effective solutions

The applied layer of RHEOTEC XL coating acts as a highly protective barrier between the liquid metal and the sand substrate, helping to prevent common casting defects and resulting in:

- + Reduced fettling and grinding costs
- + Reduced shot-blasting costs
- + Increased productivity – faster casting through put
- + Reduced core dressing operations
- + Simplified core room practice: veining sand additives can be eliminated

RHEOTEC XL+ highly permeable coatings to prevent scabbing defects

Typically a core coating will act as an impermeable barrier between the core substrate and the mould cavity, ensuring that gases formed through the thermal degradation of the core binder exit the core through predefined vents. Where adequate venting is not available or possible, there is a risk that gas pressure build-up within the core will rupture the coated core surface, resulting in scab defects, such as:

- + A non-metallic inclusion consisting of coating and core sand
- + Scab defects where metal has replaced the and ejected coating and core sand
- + Metal penetration and burn-on in the area of the core no longer protected by a coating layer
- + Gas blow-holes related to the binder decomposition gases which exit the core and become entrapped within the solidifying metal

The RHEOTEC XL+ coatings range provides all of the benefits of RHEOTEC XL coatings, and in addition have very high permeability to reduce gas pressure build-up within the core, helping to eliminate the risk of scab defects where adequate venting is not possible (figure 5).

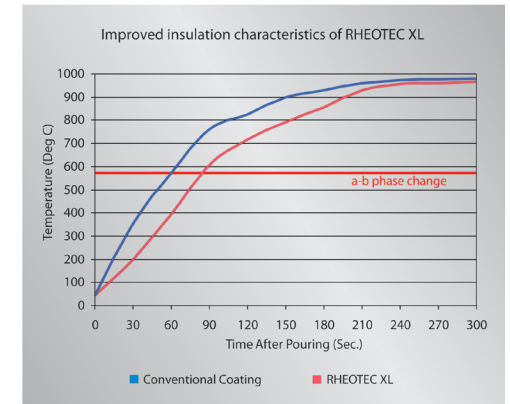


Figure 4
Delayed α - β phase transition at core-surface when using RHEOTEC XL coating

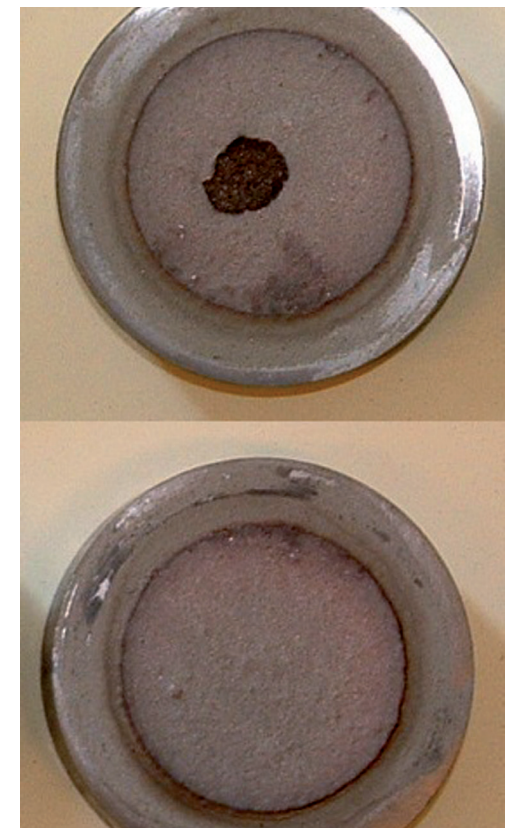


Figure 5
Scabbing of a standard coating with low permeability (top) compared with RHEOTEC XL+ coating (bottom)

High performance water-based core coatings

for highest casting quality

High performance water-based core coatings

RHEOTEC XL and XL+ coatings are formulated and controlled to offer consistency and reliability to the most demanding users, and supported by cutting edge laboratory facilities and application support (figure 6).

Controlled and automated manufacturing processes ensure that RHEOTEC XL and RHEOTEC XL+ coatings are supplied to a highly consistent specification, eliminating batch to batch product variances which could be reflected in the integrity of the cast component (figure 7).

Figure 6
Development and
process control to
meet the highest
foundry
requirements



Figure 7
Controlled and
automated
manufacturing
processes



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Foseco International Limited
Drayton Manor Business Park,
Tamworth, Staffordshire,
England B78 3TL
Phone: +44 (0)1827 262021
Fax: +44 (0)1827 283725
www.foseco.com
Please contact your local Foseco team